

We claim:

1. An isolated polynucleotide derived from a fungal source, which polynucleotide comprises a nucleotide sequence encoding an enzyme having endoglucanase activity.
- 5 2. An isolated polynucleotide selected from the group consisting of:
 - (a) a nucleic acid sequence which encodes or is complementary to a sequence which encodes an EGVIII polypeptide having at least 85% sequence identity to the amino acid sequence presented in Figure 2 (SEQ ID NO:2);
 - 10 (b) a nucleic acid sequence which encodes or is complementary to a sequence which encodes an EGVIII polypeptide having at least 90% sequence identity to the amino acid sequence presented in Figure 2 (SEQ ID NO:2);
 - (c) a nucleic acid sequence which encodes or is complementary to a sequence which encodes an EGVIII polypeptide having at least 95% sequence identity to the amino acid sequence presented in Figure 2;
 - 15 (d) a nucleic acid sequence which encodes or is complementary to a sequence which encodes an EGVIII polypeptide having the amino acid sequence presented in Figure 2;
 - (e) a nucleic acid sequence which encodes or is complementary to a sequence which encodes an EGVIII polypeptide having at least 95% sequence identity to the amino acid sequence presented as SEQ ID NO:2;
 - 20 (f) a nucleic acid sequence which encodes or is complementary to a sequence which encodes an EGVIII polypeptide having the amino acid sequence presented as SEQ ID NO:2;
 - (g) a nucleic acid sequence presented as SEQ ID NO:4, or the complement thereof; and
 - 25 (h) a nucleic acid sequence that hybridizes, under high stringency conditions to the sequence presented as SEQ ID NO:4, or the complement or a fragment thereof, wherein said isolated polynucleotide encodes a polypeptide having the biological activity of an endoglucanase.
- 30 3. The isolated polynucleotide of Claim 2, wherein % identity is calculated using the CLUSTAL-W program in MacVector version 6.5, operated with default parameters, including an open gap penalty of 10.0, an extended gap penalty of 0.1, and a BLOSUM 30 similarity matrix.

4. The isolated polynucleotide of Claim 2, wherein hybridization is conducted at 42°C in 50% formamide, 6X SSC, 5X Denhardt's solution, 0.5% SDS and 100 µg/ml denatured carrier DNA followed by washing two times in 2X SSPE and 0.5% SDS at room temperature and two additional times in 0.1 SSPE and 0.5% SDS at 42°C.
5. The isolated polynucleotide of Claim 2, wherein said polynucleotide is an RNA molecule.
6. The isolated polynucleotide encoding an enzyme having endoglucanase activity, wherein the enzyme is derived from a *Trichoderma* source.
10. 7. The isolated polynucleotide of Claim 6, wherein the enzyme is derived from *Trichoderma reesei*.
8. An expression construct including a polynucleotide sequence (i) having at least 85% sequence identity to the amino acid sequence presented in Figure 2 (SEQ ID NO:2), or (ii) being capable of hybridizing to a probe derived from the 15 nucleotide sequence disclosed in Figure 2 under conditions of intermediate to high stringency, or (iii) being complementary to a nucleotide sequence having at least 85% sequence identity to the amino acid sequence presented in Figure 2 (SEQ ID NO:2).
9. A vector including the expression construct of Claim 8.
20. 10. A vector comprising an isolated polynucleotide of Claim 2, operably linked to control sequences recognized by a host cell transformed with the vector.
11. A host cell transformed with the vector of Claim 9.
12. A host cell transformed with the vector of Claim 10.
13. The host cell of Claim 12, which is a prokaryotic cell.
25. 14. The host cell of Claim 12, which is a eukaryotic cell.
15. A recombinant host cell comprising a polynucleotide of Claim 2.
16. The recombinant host cell of Claim 15, which is a prokaryotic cell.
17. The recombinant host cell of Claim 15, which is a eukaryotic cell.
18. A substantially purified EGVIII polypeptide with the biological activity of an 30 endoglucanase, comprising a sequence selected from the group consisting of:
- (a) an amino acid sequence having at least 85% sequence identity to the amino acid sequence presented in Figure 2 (SEQ ID NO:2);
- (b) an amino acid sequence having at least 90% sequence identity to the amino acid sequence presented in Figure 2 (SEQ ID NO:2);
- 35 (c) an amino acid sequence having at least 95% sequence identity to the amino acid sequence presented in Figure 2;
- (d) an amino acid sequence presented in Figure 2;

- 5 (e) an amino acid sequence having at least 95% sequence identity to the
amino acid sequence presented as SEQ ID NO:2;
(f) an amino acid sequence presented as SEQ ID NO:2;
(g) a substantially purified biologically active fragment of the amino acid
sequence presented as SEQ ID NO:2.
- 10 19. A method of producing an enzyme having endoglucanase activity, comprising:
(a) stably transforming a host cell with an expression vector comprising a
polynucleotide as defined in Claim2;
(b) cultivating said transformed host cell under condition suitable for said
host cell to produce said endoglucanase; and
(c) recovering said endoglucanase.
- 15 20. The method of Claim 19 wherein the host cell is a filamentous fungi or yeast cell.
21. A purified enzyme having endoglucanase activity prepared by the method of
Claim 19.
- 15 22. A recombinant host cell comprising a deletion or insertion or other alteration in
the *eg/8* gene which inactivates the gene and prevents EGVIII polypeptide
production.
- 20 23. An antisense oligonucleotide complementary to a messenger RNA that encodes
an EGVIII polypeptide having the sequence presented as SEQ ID NO:2, wherein
upon exposure to a endoglucanase-producing host cell, said oligonucleotide
decreases or inhibits the production of endoglucanase by said host cell.
- 25 24. The antisense oligonucleotide of Claim 23, wherein the host cell is a filamentous
fungi.
- 25 25. A detergent composition, said composition comprising a polypeptide selected
from the group consisting of:
(a) an amino acid sequence having at least 85% sequence identity to the
amino acid sequence presented in Figure 2 (SEQ ID NO:2);
(b) an amino acid sequence having at least 90% sequence identity to the
amino acid sequence presented in Figure 2 (SEQ ID NO:2);
30 (c) an amino acid sequence having at least 95% sequence identity to the
amino acid sequence presented in Figure 2;
(d) an amino acid sequence presented in Figure 2;
(e) an amino acid sequence having at least 95% sequence identity to the
amino acid sequence presented as SEQ ID NO:2;
35 (f) an amino acid sequence presented as SEQ ID NO:2;
(g) a substantially purified biologically active fragment of the amino acid
sequence presented as SEQ ID NO:2.

26. A method of expressing a heterologous polypeptide having β -glucosidase activity in an *Aspergillus* species, comprising:
- (a) Providing a host *Aspergillus* with an expression vector comprising a polynucleotide encoding a signal sequence linked to a polynucleotide encoding a heterologous β -glucosidase, thereby encoding a chimeric polypeptide;
 - (b) Cultivating said host *Aspergillus* under conditions suitable for said *Aspergillus* to produce said chimeric polypeptide, wherein said chimeric polypeptide is produced.
- 5 27. A method of producing ethanol, said method comprising the steps of:
- a) contacting a biomass composition with an enzymatic composition comprising β -glucosidase 4 to yield a sugar solution;
 - b) adding to the sugar solution a fermentative microorganism; and
 - c) culturing the fermentative microorganism under conditions sufficient to produce ethanol,
- 10 15 wherein the biomass composition may be optionally pretreated.
28. The method of claim 27 wherein step (a) further comprises the addition of at least one endoglucanase.
- 20 29. The method of claim 27 wherein step (a) further comprises the addition of at least one cellbiohydrolase.
- 25 30. The method of claim 28 wherein step (a) further comprises the addition of at least one cellbiohydrolase.
31. The method of claim 27 wherein the pretreatment is with a dilute acid.
32. A method of producing ethanol, said method comprising the steps of:
- 30 a) contacting a biomass composition with an enzymatic composition comprising a β -glucosidase 4 and a fermentative microorganism; and
- 35 b) culturing the fermentative microorganism under conditions sufficient to produce ethanol,
- 35 wherein the biomass composition may be optionally pretreated.
33. The method of claim 32 wherein step (a) further comprises the addition of at least one endoglucanase.
- 40 34. The method of claim 32 wherein step (a) further comprises the addition of at least one cellbiohydrolase.
- 35 35. The method of claim 33 wherein step (a) further comprises the addition of at least one cellbiohydrolase.
- 45 36. The method of claim 32 wherein the pretreatment is with a dilute acid.